Manitoba

Agriculture

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Beef Facts

CANADA'S BEEF CATTLE GRADING SYSTEM

The Canadian grading system is a means of dividing beef carcasses into uniform groups based on quality. It assists producers, market operators, packers, wholesalers, retailors and consumers in having a clear understanding of the product they are producing and purchasing.

Such a grading system is needed because of variations in size, breed, sex, age and degree of finish of marketed livestock. All of these characteristics affect the quality of carcass yielded by the live animal. A grading system ensures beef producers receive the proper price for the quality of product produced and consumers receive the quality of product they desire and pay for.

How the Grading System Functions

Canada's grading system was developed by Agriculture Canada. It has been designed so that one set of grading standards are applied uniformly across the country. Beef cattle slaughtered in Canada are subjected to inspection by Agriculture Canada or provincial meat inspectors prior to grading. This insures that the animal is healthy with a wholesome carcass. Carcasses are then graded by Agriculture Canada graders, usually the morning after slaughter.

For a given carcass, a grade is assigned on the basis of these four factors: maturity, muscling, quality (color and firmness of the muscle tissue and fat), and fatness.

Maturity

It is widely recognized that the age of the animal affects the tenderness of the beef more than any other factor. The grading system therefore recognizes the following three maturity stages:

Maturity 1, which is for youthful animals in the A and B grades. This stage represents the largest class of cattle graded with the majority being finished steers, virgin bulls and heifers.

Maturity 2, which is for intermediate aged animals, mostly in the C1 and C2 grades. It includes young cows and bulls, some steers and aged heifers two - four years of age.

Maturity 3, which is for mature animals in the D and E grades. Mostly cows and bulls over four years of age.

Graders recognize the age of carcasses by assessing the colour and degree of ossification in the cartilage and bones of the carcass.

Muscling

Muscling refers to the amount of fleshing built on to the bone structure or foundation of the carcass and pertains to the general build, outline or shape of the carcass. While the muscling requirements for the top grades of beef are not as stringent as in past grading systems, a well muscled carcass is still more desirable than one with only medium or deficient muscling. Youthful carcasses with good to excellent muscling are eligible for the A grades. Medium or better fall into the B grades. Intermediate age carcasses with good to excellent muscling are eligible for the C1 and C2 grades. Mature carcasses and intermediate age carcasses not eligible for the C1 and C2 grades fall into the D1, D2, D3 and D4 grades with muscling varying from good in the D1 grade to extremely deficient in the D3 grade. The D3 grade also includes the occasional younger steer or heifer with very deficient muscling and/or little or no fat. The D4 grade is reserved for excessively fat carcasses. The E grade includes mature bulls with any degree of muscling or fatness, as well as a few younger bulls with muscle tissue that is dark red in color.

Quality

Quality is the potential for cooking and eating satisfaction, with maturity of the carcass the main factor affecting tenderness, and therefore quality. Youthful carcasses with lean meat — that is bright red and having a firm white fat cover — produce cuts of meat with the greatest potential for consumer satisfaction.

The A grades therefore require meat that is firm and bright red and fat cover which is firm and white or slightly tinged with reddish or amber color. Within the B grades the meat color may range from bright to dark red, with firm to slightly soft fat cover which may be white to pale yellow in color. The C1 and C2 grades require the same quality characteristics as carcasses eligible for the A grades. Quality factors are less important in the D and E grades.

Meat Yield

The meat yield is the percentage of the carcass that can be sold as edible meat. Research has shown that the amount of fat covering on a carcass is the most significant factor affecting the yield of edible cuts. This finding led to a revision in the grading system in 1972, and in 1986 that introduced fat measurements for the A, B and C grades separating each grade into fat categories — A1, A2, A3, A4: B1, B2, B3: C1, C2, according to definite fat measurements. Table 1 gives the fat levels which define each of the A, B and C grades.

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Table 1 — Fat Level of Canada A, B and C Warm Carcasses — All weights — 150 Kg (330.4 lb.) +

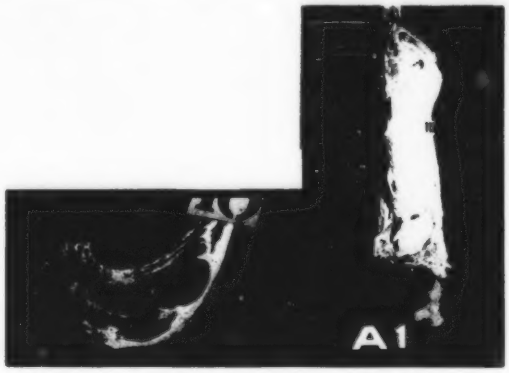
A1	A2	A3	A4	B1	B2	B3	C1	C2
4-9mm	9-14mm	14-19mm	over 19mm	2-4mm	1mm or more	1mm or more	1-9mm	9-19mm

As the fat measurement increases, the yield of retail cuts decreases. Thus a higher yield of retail cuts is expected from an A1 side of beef compared to a A2. Similarly, the yield of cuts drops further in the A3 and A4 grades. This is very significant in the pricing of beef carcasses with the leaner A1 and A2 carcasses being the most desired and thus the most valuable.

When maturity, muscling, quality, fatness and sex factors have been considered, each grade classification takes on the following specifications.

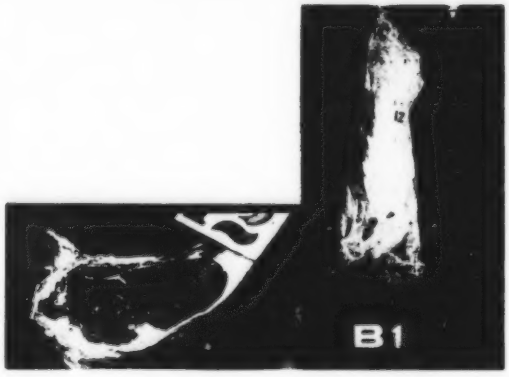
Canada A1, A2, A3 & A4

- youthful
- lean which is bright red in color and firm
- fat cover extending well over the carcass is firm and white or tinged with a reddish or amber color
- muscling that is free from marked angularity and depressions in the hips and chucks and is free from narrowness through the loins and ribs
- fat measurement as applied to Table 1.



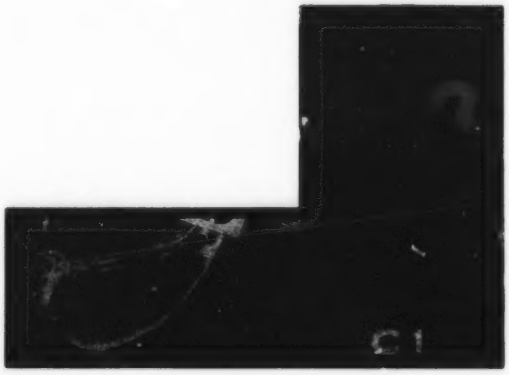
Canada B1, B2 and B3

- youthful
- lean which is bright red in color in the B1, B3 and dark red in the B2
- fat cover is firm, white to amber for B1; firm or slightly soft, white to pale yellow for B2 and B3. Fat cover may be somewhat lacking on the hips and chucks
- muscling that is the same as A grade for B1 and medium to excellent that may have some deficiencies for the B2, B3
- fat measurement as applied to Table 1.



Canada C1 and C2

- Intermediate Age
- lean which is firm, bright red in color
- fat cover extending well over the carcass is firm and white to amber in color
- muscling that is free from marked angularity and depressions in the hips and chucks, and is free from narrowness through the loins and ribs
- fat measurement as applied to Table 1.



Canada D

- D1 maturity intermediate or mature; good to excellent muscling; fat cover not excessive, white to pale yellow — firm and extends well over the ribs and loins, moderately well over the hips and chucks
- D2 maturity intermediate or mature; medium to excellent muscling that may have some deficiencies; fat cover not excessive, white to lemon yellow — firm to slightly soft and extends moderately well over the ribs and loins with a light covering over the hips and chucks
- D3 youthful to mature; any degree of muscling; fat cover ranges from no fat to not excessive with any degree of color and texture
- D4 youthful to mature having excessive proportions of fat

Canada E

- Youthful bulls or stags with pronounced masculinity and having lean that is dark red in color and sticky
- Intermediate or mature bulls and stags with pronounced masculinity.

A detailed description of each grade classification is given in Table 2.

TABLE 2
Grade Specifications Beef Grading System — 1986

GRADE	MATURITY (AGE)	LEAN QUALITY		FAT QUALITY AND DISTRIBUTION			MUSCLING
		COLOR	TEXTURE	COLOR	TEXTURE	DISTRIBUTION - MEASUREMENT	
A	I Youthful **CARCASS WEIGHT** Beef — 150 kg (330 lbs.) +	Bright red	Firm	White or slightly tinged with reddish or amber color	Firm	Extends well over exterior surface, but may be somewhat lacking on hips **or** chucks. Marbling at least slight. Grade divided into four fat categories, according to following measurement taken at rib eye surface. A1 4-9 mm (.15-.35 in.) A3 14-19 mm (.55-.74 in.) A2 9-14 mm (.35-.55 in.) A4 over 19 mm (over .74 in.)	Free from marked angularity and depressions in the hips & chucks and is free from narrowness through the loins and ribs.
B	I Youthful	Bright red to medium dark red	Moderately firm	White to a yellowish tinge	Firm or slightly soft	Extends over most of the exterior surface, but may be somewhat lacking on the hips **and** chucks. No marbling required. Grade divided into four fat categories as follows: B1 2-4 mm (.08-.15 in.); B2 and B3 1 mm (.04 in.) or more. B2 is the designated grade for dark cutter.	Muscling requirement is the same as grade A
C_1	I & II Youthful & Intermediate	Bright red to medium dark red	Moderately firm	White to pale yellow	Firm to soft	At least a light fat cover extending over hips, loins, ribs and chucks. No excess proportion of fat. Marbling — none.	Low medium to excellent muscling. Progressively better muscling as the physiological age approaches the maximum for the grade.
C_2	I & II Youthful & Intermediate	Bright to dark red	Firm to soft	White to lemon yellow	Firm to soft	At least a slight fat covering on the ribs and loins.	Deficient to excellent muscling.
D_1	III Mature	—	—	White to pale yellow	Firm	Extends well over the ribs and loins and moderately over the hips & chucks. No excess proportion of fat.	Good to Excellent
D_2	III Mature	—	—	White to lemon yellow	Slightly soft	Extends over the ribs and loins, with a **light** covering over the hips and chucks. No excess proportion of fat.	Medium muscling that may have some deficiencies.

(Table 2 continued) Grade Specifications Beef Grading System — 1986

D_3	III Mature	—	—	White to deep lemon yellow	Soft	Extends over the ribs and loins with a **slight** amount over the hips and chucks. No excess proportion of fat.	Muscling may have marked deficiencies.
D_4	I to III Youthful to mature	—	—	Any color	—	Over fat & wasty. Excess proportion of fat (overfat cows & young cows).	Deficient to excellent depending upon age.
D_5	I to III Youthful to mature	Very deficient	Very deficient	—	—	Little **or** no fat covering.	Very deficient in muscling and quality to the degree of emaciation.
E	I to III Youthful to mature	Medium dark to dark red	Sticky coarse	—	—	—	Pronounced masculinity. Varying degrees of muscling. (Bulls and stags)

Veal Grading

Agriculture Canada introduced a new veal grading system in June, 1984. Previously, the veal grading system placed strong emphasis on superior muscling and plentiful fat covering, but did not place sufficient emphasis on lean color.

The new grades in addition to considering the amount of muscling on a carcass and a reasonable fat cover, separate the A and B grades into A1, A2, A3, A4; B1, B2, B3 and B4 based on the color of the lean. A1 and B1 are pale pink in color; A2 and B2 pink; A3 and B3 pale red; and A4 and B4 red. The color readings are measured using a Color Reflectance metre.

Table 3 details specifications on the new veal grades.

By accurately describing beef carcasses, the grading system serves the producer in relating what he has produced to the type of carcass most in demand. The system is used as a basis of settlement to the producer if he elects to sell cattle on the rail grade and dressed weight basis. The grading system is also of value to the packer, wholesaler and retailer in the trading of beef and to the consumer as an indication of eating quality.

TABLE 3
Veal Grade Specifications - June, 1986

GRADE	MUSCLING	FAT COVER		LEAN TEXTURE & COLOR	
		EXTERNAL	INTERNAL	TEXTURE	COLOR READING
A1 A2 A3 A4	Muscling is at least good, is free of depressions and has at least three of the following characteristics: 1. at least a straight profile of the upper portion of the leg from the tail head to the hock joint 2. loins are wide and thick 3. racks that have spinal processes that are well covered by flesh 4. shoulder joints that are well covered by flesh (Veal Carcass Weight - warm carcass) (Less than 363.4 lbs. (165 kg) with hide on) (Less than 330.4 lbs. (150 kg) with hide off)	very thin over the backs and loins of lighter carcasses and at least light on heavier carcasses	kidneys that are covered with fat that is not excessive and is creamy white or tinged with pink in color	flesh is at least moderately firm	A1 - at least bright pink and has a color reading of 50 or more A2 - pink with color reading of 40-49 A3 - pale red with reading of 30-39 A4 - red with reading of 0-29 (Color reflectance metre is used to take readings on brisket)
B1 B2 B3 B4	Muscling is at least low medium, has some depressions and has at least three of the following: 1. hip points are noticeable but not prominent 2. loins have depressions on both sides of dorsal processes 3. spinal processes of the rack are sparsely covered by flesh 4. shoulder points are noticeable but not prominent	thin small patches on the backs and loins on lighter carcasses and heavier deposits on heavier carcasses	kidneys are covered with fat deposits ranging from small to excessive	moderately firm or slightly coarse	color criteria for B1, B2, B3 and B4 are the same as for A1, A2, A3 and A4
C1 C2	Muscling is deficient to excellent	little or no exterior fat	extremely small fat deposits on kidneys	flesh is coarse, soft and moist	C1 - flesh is pink or lighter in color and has a reading of 40 or more C2 - flesh is pale to dark red and a reading of 39 or less

(Extracted from the Veal Carcass Grading Regulations June 7/84)

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